
Pluripotent Stem Cell-Based Therapies in Combination with Substrate for the Treatment of Age-Related Macular Degeneration.

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Public Summary:

Age-related macular degeneration (AMD) is the leading cause of blindness in the western world, which severely decreases the quality of life in the patients and places an economic burden on their families and society. The disease is caused by the dysfunction of a specialized cell layer in the back of the eye called the retinal pigmented epithelium (RPE). Pluripotent stem cells can provide an unlimited source of RPE, and laboratories around the world are investigating their potential as therapies for AMD. To ensure the precise delivery of functional RPE to the diseased site, some groups are developing a therapy composed of mature RPE monolayers on a supportive scaffold for transplantation as an alternative to injecting a single-cell suspension. This review summarizes methods of generating RPE from pluripotent stem cells, compares biodegradable and biostable materials as scaffolds, and describes the specific combination of human embryonic stem cell-derived RPE on Parylene-C membranes, which is scheduled to begin clinical trials in the United States in 2016. Stem cell-derived RPE monolayers on scaffolds hold great promise for the treatment of AMD and other retinal diseases.

Scientific Abstract:

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